

NIH News in Health

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The Sorrow of Suicide

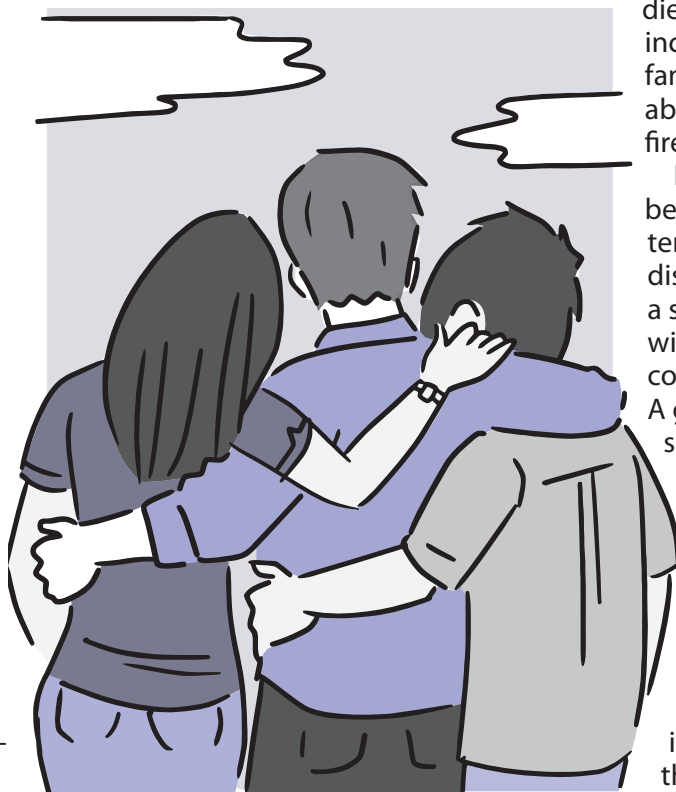
Awareness and Action Can Help Save a Life

Suicide is tragic. It cuts a life short, and it devastates the family, friends and loved ones left behind. Those who survive a suicide attempt might end up with severe disability or other injuries. The children of people who die by suicide are more likely to later die by suicide themselves. With such extreme consequences, why would anyone make the dire decision to choose death over life?

That's a question scientists have been struggling to answer for decades. "When you're in a suicidal state, you're kind of closing down your options. You see it as the only solution. You're not really able to entertain other ideas," says Dr. Jane Pearson, who heads a suicide research consortium at NIH. "What's the science behind that? What's happening in the brain that leads people to think so dysfunctionally?"

Only 20 years ago, little was known about the biology of suicide. But NIH-funded research has helped to open up new avenues for exploring the underlying causes of suicide. While the biological details are still being worked out, scientists have uncovered many clues to identify people at greatest risk for suicidal thoughts and actions.

Recognizing those at risk is essential. Suicide is the 10th leading cause of death nationwide, and it's the 3rd leading cause of death among adolescents. Nearly 37,000 Americans died by suicide in 2009, according to the U.S. Centers for Disease Control



and Prevention. More than half of those deaths were from firearms.

People of all genders, ages and ethnicities are at risk for suicide. Women are more likely than men to attempt suicide, but men are more likely to die by suicide. That's because men often choose deadlier methods, such as firearms or suffocation.

"The highest risk groups are older men," says Pearson. "In fact, white men who are 85 and older have a rate of suicide that's 4 times the national average."

Suicide risk is also higher among people who have certain mental disorders, including schizophrenia and bipolar disorder. Depression affects more than half of those who

die by suicide. Other risk factors include a prior suicide attempt, a family history of suicide, substance abuse, or having guns or other firearms in the home.

In the past, many scientists believed that suicide was a terrible side effect of other mental disorders. But why is it that only a small proportion of people with depression or other mental conditions attempt suicide?

A growing body of evidence suggests that there is something unique about their biology that can tip them over the edge.

"We've found many systems in the brain that are broken with suicide, especially in the front part above the eye—called the orbital prefrontal cortex. That area of the brain is involved in inhibiting behaviors that are damaging, like being unable to inhibit the urge to kill oneself," says Dr. Victoria Arango, a suicide researcher at the New York State Psychiatric Institute.

Over the decades, Arango and her colleagues have conducted detailed studies of brain structure and biology in hundreds of suicide victims. They've found that certain brain regions in suicide have fewer nerve cells and altered receptors for

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neurotransmitters. Abnormalities related to the neurotransmitter serotonin have been linked to suicide in many studies. Scientists have not yet figured out if these flaws in serotonin directly contribute to suicide or—more likely—if serotonin is one part of a complicated chemical pathway to suicide. Serotonin is also believed to play a key role in depression and response to stress and trauma.

“Stress and trauma certainly play a big role in suicide, especially early life stress,” says Dr. Douglas Meinecke, an NIH scientist who studies the molecular details of mental disorders. Several research teams have found evidence that traumatic childhood experiences—such as abuse or violence—can “tag” certain **genes** in the brain. These tags, called epigenetic markers, are actually molecules that attach to genes. They can have a lasting effect on whether the genes are turned off or on.

Some NIH-funded studies have shown that suicide victims who were abused as children have unique epigenetic markers on certain genes.



Definitions

Neurotransmitters

Chemicals that send signals from one nerve cell to another.

Genes

Stretches of DNA, a substance you inherit from your parents, that define characteristics such as how likely you are to get certain disorders.



Web Links

For more information about suicide, see our links online:

<http://newsinhealth.nih.gov/issue/May2012/Feature1>

These markers were not found in suicide victims with no history of childhood abuse or in people who died in accidents. More research into how stress affects genes and suicide risk might offer new chances for early intervention.

Current approaches to treating or preventing suicide generally aim to relieve the accompanying mental condition or other risk factors. “If you focus on making people who have mental disorders as well as they can be, managing life as well as they can or reducing their suicidal thoughts, you can greatly reduce suicide overall,” says Meinecke.

Medications—such as antidepressants and antipsychotics—can help. Psychotherapy, or “talk therapy,” can also be effective. One type, called cognitive behavioral therapy, can help people learn new ways to deal with stressful situations by training them to consider alternative actions when thoughts of suicide arise.

One of the most effective tools for preventing suicide is to know the warning signs and take quick action to get the person into treatment. “One of the biggest indicators of suicide risk is when somebody begins talking about suicide,” says Dr. David Brent, a psychiatrist at the University of Pittsburgh who studies



Wise Choices Suicide Warning Signs

The more warning signs, the greater the risk of suicide. Get help from a mental health professional or the National Suicide Prevention Lifeline at 1-800-273-TALK.

- Talking about wanting to die
- Actively looking for a way to kill oneself
- Talking about feeling hopeless or having no purpose
- Talking about feeling trapped or in unbearable pain
- Talking about being a burden to others
- Abusing alcohol or drugs
- Acting anxious, agitated or reckless
- Having sleep troubles
- Withdrawing or feeling isolated
- Having extreme mood swings
- Giving away belongings, including treasured objects

suicide in families. “We used to think that talking about suicide meant you weren’t going to do it, but it’s really the opposite. Other warning signs include withdrawal from usual activities, a change in mood or a change in sleep patterns.”

Never ignore someone’s talk of suicide. You can ask directly if the person has ever thought of harming himself or herself. Most people will answer honestly, and the question itself won’t push a person to attempt suicide.

See the “Wise Choices” box to learn more, or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255). This free, federally funded service is available to anyone, 24 hours a day, 7 days a week. All calls are confidential. ■

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Summer Swintime

Staying Healthy at the Pool and Beach

Summer is a great time to go out and have fun in the water. But recreational waters—including swimming pools, lakes and oceans—can sometimes get contaminated with bacteria and viruses. Swimming in contaminated water can make you and your family sick.

The most common illnesses caused by contaminated water are stomach and intestinal upsets, usually with vomiting or diarrhea. You can pick up these conditions at the beach or even at properly treated swimming pools, because chlorine doesn't kill germs right away. Sometimes people don't even realize that they got sick from swimming, because it can take 1 to 3 days for symptoms to appear. Most of these illnesses aren't dangerous, and they go away in a few days. But they sure can put a kink in your summer plans.

Natural water sources, including lakes, rivers and oceans, often get contaminated from storm water runoff. As rain water flows over places like parks, lawns and farms, it can pick up bacteria and viruses

from animal feces. Then the water collects in storm drains and can be exposed to leaky underground sewage pipes. Eventually, the water flows out to the beach.

"We find that the storm water that's released to beach areas is extremely contaminated," says Dr. Sandra McLellan, an NIH-funded researcher at the University of Wisconsin-Milwaukee. Her laboratory tracks the sources of water contamination. "Let's find the sources, let's remove the sources, and then we'll have a cleaner beach overall," she says.

Lake and ocean water near storm-water outfall pipes—the places where drains or sewers release their contents—tends to be calm, shallow and warm. These conditions may seem perfect for little kids, but it's also an ideal home for bacteria and viruses. "Don't play near the storm-water outfall pipes," McLellan warns. And if it's rained in the last 24 hours, check the beach posting signs to see if it's safe to go in the water.

Many popular public beaches get tested regularly for contamination. Health departments usually look for certain types of bacteria that are common in sewage. If the count of these bacteria is higher than the recommended limit set by the U.S. Environmental Protection Agency (EPA), that means at least 1 in every 50 swimmers is likely to get sick. Usually, health departments will close the beach until it's clean again.



Dr. Rachel Noble, a researcher at the University of North Carolina in Chapel Hill, studies bacteria that hang out naturally in coastal waters. Some of these bacteria, including a few *Vibrio* species, are especially dangerous for people with certain medical conditions, such as diabetes or liver disease. "If you have a compromised immune system and you get a *Vibrio* infection, those are going to be very serious," Noble says. The infections might even be deadly. If you have a medical condition that affects your immune system, talk to your doctor before heading for the water.

Our shared oceans and lakes are great for fun and relaxation. But our habits on land affect the quality of these precious resources. "Doing small things, like picking up after your dog and recycling your oil, really makes a difference," says Noble. Find out where the storm water goes in your area. With a little knowledge, you can enjoy the water this summer—and stay healthy too! ■



Wise Choices Water Safety

- Shower before and after going into a swimming pool.
- Stay out of the water if you've had diarrhea in the last 2 weeks to help protect others from infectious germs.
- Try not to swallow recreational water.
- Avoid swimming or playing near places where storm water is released on the beach.
- Stay out of the water for at least 24 hours after a storm.
- Always wash your hands before you eat or drink.



Web Links

For more information about water safety, see our links online:
<http://newsinhealth.nih.gov/issue/May2012/Feature2>



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/May2012/Capsule1>

Danger in Shifting Summer Temperatures

Summer temperatures that spike up and down may boost the risk of death in older people who have long-term illnesses, a new study suggests.

Most people get used to the temperatures where they live, whether cold Connecticut or muggy Mississippi. When summer heat waves strike, death rates can climb for at-risk people, such as those who are very young, very old or ill. But scientists have been unsure about the effects

of sudden temperature changes. Climate models predict that big day-to-day shifts in summer temperatures may become more common.

To take a closer look, NIH-funded scientists analyzed Medicare data on more than 3.7 million at-risk people, ages 65 and older, in 135 U.S. cities. All had been released after hospitalization for a long-term illness, such as diabetes or a heart attack. Patients were tracked for up to 21 years.

The scientists found that greater swings in summer temperatures were linked to shorter survival. The link between temperature shifts and death was especially strong in those 75 and older. Survival times were longer in cities with higher proportions of green space, including parks and tree-filled areas. Shorter survival times were seen in densely populated cities.

"We found that, independent of heat waves, high day-to-day variability in summer temperatures shortens life expectancy," says Dr. Antonella Zanobetti of the Harvard School of Public Health. "This variability can be harmful for susceptible people." ■

Healthy Vision for a Lifetime

Most of us take our eyesight for granted—unless something goes wrong. May is Healthy Vision Month, so it's a great time to learn how to make healthy vision last a lifetime.

Eye disorders such as age-related macular degeneration, glaucoma and diabetic retinopathy affect millions of Americans, robbing many of their vision. "Thankfully, in the last decade, medical researchers have developed highly effective, sight-saving treatments," says Dr. Paul A. Sieving, director of NIH's National Eye Institute. "However, these treatments are only effective if the disease is diagnosed before it causes vision loss."

Several eye disorders have no early warning signs. They can only be detected through a comprehensive dilated eye exam. Having regular exams is the best way to protect your eye health.

Keep your vision at its best. Learn more at www.nei.nih.gov/healthyeyes. ■



Wise Choices Tips for Eye Health

- **Know your family history.** Some eye disorders are inherited. Talk with your eye care professional about your family's eye health.
- **Eat right to protect your sight.** Foods rich in omega-3 fatty acids and vitamins A and C may help your eye health.
- **Give it a rest.** Work at a computer? Every 20 minutes, look about 20 feet in front of you for 20 seconds to reduce eyestrain.
- **Let the sun shine.** Wear sunglasses that block at least 99% of UV-A and UV-B radiation.
- **Clean hands for a clear vision.** Wash your hands before handling contact lenses. Disinfect and replace them as instructed.



Featured Website Weight-control Information Network

www.win.niddk.nih.gov

This website offers a wealth of up-to-date, science-based tips for eating healthy, getting active and achieving a healthy weight. Explore ideas to help you get fit and fabulous, energize your family and take charge of your health.



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